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6. AUTHORS
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13. ABSTRACT *(Maximum 200 words)*

The primary project objective, to establish a long-termGeologic/Acoustic Natural Laboratory (GANL) near 7°50'-10°30'N on the East Pacific Rise, has been achieved and published in a widely circulated map series. The GANL for a fast-spreadingenvironment includes total coverage at a large scale within the area using combined Sea Beam and SeaMARC II bathymetry and side scan sonar. This objective has been achieved not only for the designated ONR Laboratory, but also for the East Pacific Rise and its flanks from 7°N to 18°N. We have also completed most of the quantitative interpretation of these data to assess the roles of faulting vs. volcanism in creating the ubiquitous abyssal hills of the ocean floor, the most common yet poorly understood terrain element on the earth's solid surface.

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AUGMENTATION AWARDS FOR SCIENCE & ENGINEERING RESEARCH TRAINING (AASERT) REPORTING FORM

The Department of Defense (DOD) requires certain information to evaluate the effectiveness of the AASERT program. By accepting this Grant Modification, which bestows the AASERT funds, the Grantee agrees to provide the information requested below to the Government's technical point of contact by each annual anniversary of the AASERT award date.

1. Grantee identification data: (R & T and Grant numbers found on Page 1 of Grant)

   a. Regents of the University of California
   University Name

   b. N00014-90-J-1645
   Grant Number

   c. 4253121---05
   R & T Number

   d. Ken C. Macdonald
   P.I. Name

   e. From:1 Jun 1992 To:30 Sep 1996
   AASERT Reporting Period

NOTE: Grant to which AASERT award is attached is referred to hereafter as "Parent Agreement."

2. Total funding of the Parent Agreement and the number of full-time equivalent graduate students (FTEGS) supported by the Parent Agreement during the 12-month period prior to the AASERT award date.

   a. Funding: $58,422 (1Mar91-31 Oct92)

   b. Number FTEGS: 7

3. Total funding of the Parent Agreement and the number of FTEGS supported by the Parent Agreement during the current 12-month reporting period.

   a. Funding: $ N/A (Extension period)

   b. Number FTEGS: 4

4. Total AASERT funding and the number of FTEGS and undergraduate students (UGS) supported by AASERT funds during the current 12-month reporting period.

   a. Funding: $100,475

   b. Number FTEGS: 1

   c. Number UGS: 0

VERIFICATION STATEMENT: I hereby verify that all students supported by the AASERT award are U.S. citizens.

Ken C Macdonald — Principal Investigator

8/11/97 — Date

ONR FINAL REPORT: GEOLOGIC/ACOUSTIC NATURAL LABORATORY ON THE EAST PACIFIC RISE [N00014-90-J-1645]

K. C. Macdonald, Department of Geological Sciences, UCSB, Santa Barbara, CA 93106

Our goal has been to understand the primary variables that control the shape of the deep ocean floor, and to facilitate the efforts of other ONR researchers toward this goal by making high resolution bathymetric and side-scan sonar data available to the ONR community. The primary project objective, to establish a long-term Geologic/Acoustic Natural Laboratory (GANL) near 7°50'-10°30'N on the East Pacific Rise, has been achieved and published in a widely circulated map series. The GANL for a fast-spreading environment includes total coverage at a large scale within the area using combined Sea Beam and SeaMARC II bathymetry and side scan sonar. This objective has been achieved not only for the designated ONR Laboratory, but also for the East Pacific Rise and its flanks from 7°N to 18°N. We have also completed most of the quantitative interpretation of these data to assess the roles of faulting vs. volcanism in creating the ubiquitous abyssal hills of the ocean floor, the most common yet poorly understood terrain element on the earth's solid surface [see Alexander and Macdonald, 1996].

List of most significant publications :

Alexander, R. T., and K. C. Macdonald, Small off-axis volcanoes on the East Pacific Rise, *Earth and Planetary Science Letters, 139,* 387-394, 1996.

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Carbotte, S. and K. Macdonald, East Pacific Rise 8°-10°30'N: Evolution of ridge segments and discontinuities from SeaMARC II and three-dimensional magnetic studies, J. Geophys. Res. 97: 6959-6982, 1992.

Carbotte, S. M., and K. C. Macdonald, Comparison of seafloor tectonic fabric at intermediate, fast and super fast spreading ridges: influence of spreading rate, plate motions, and ridge segmentation on fault patterns, *J. Geophys. Res., 99,* 13609-13631, 1994.

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Macdonald, K. C., D. S. Scheirer, and S. M. Carbotte, Mid-ocean ridges: Discontinuities, segments and giant cracks, *Science, 253,* 986-994, 1991.

Macdonald, K.C., Mid-oceanic ridge, in Parker, S.P., ed., McGraw-Hill Yearbook of Science & Technology, McGraw-Hill, Inc., New York, 259-262, 1992.

Macdonald, K.C., P.J. Fox, S. Miller, S. Carbotte, M.H. Edwards, M. Eisen, D.J. Fornari, L. Perram, R. Pockalny, D. Scheirer, S. Tighe, C. Weiland and D. Wilson, The East Pacific Rise and its flanks 8-18°N: History of segmentation, propagation and spreading direction based on SeaMARC II and Sea Beam studies, Mar. Geophys. Res. 14:299-344, 1992.

Macdonald, K.C., D.S. Scheirer, S. Carbotte and P.J. Fox, It's only topography, GSA Today, Jan/Feb, 1993.

Scheirer, D. S., and K. C. Macdonald, Variation in cross-sectional area of the axial ridge along the East Pacific Rise: Evidence for the magamatic budget of a fast-spreading center, *J. Geophys. Res., 98,* 7871-7885, 1993.

Scheirer, D. S., and K. C. Macdonald, Near-axis seamounts on the flanks of the East Pacific Rise, 8°N to 17°N, *J. Geophys. Res., 100,* 2239-2259, 1995.